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A. KAROLUS

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PICTURE TRANSMISSION SYSTEM

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Fig. 1

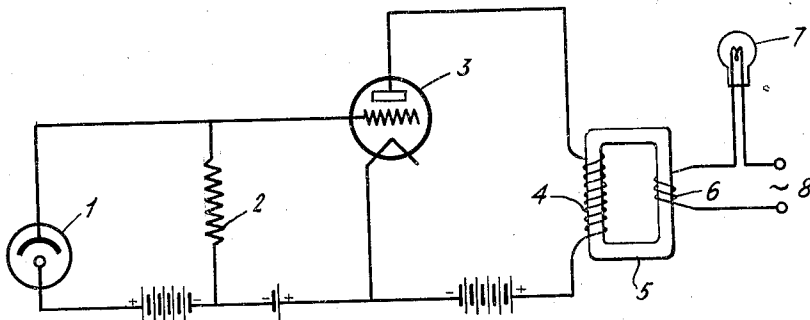


Fig. 3

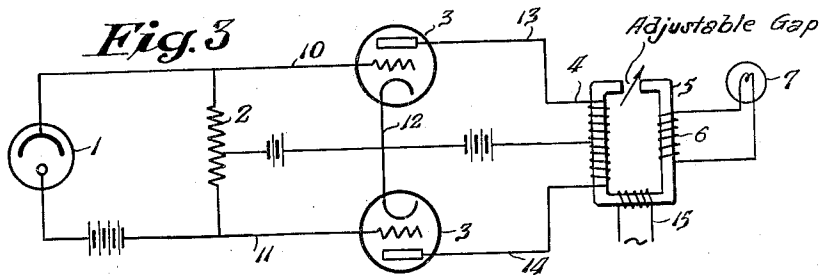
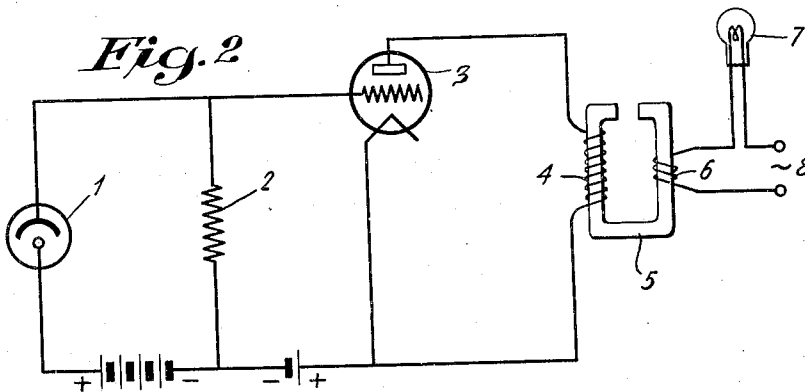


Fig. 2



INVENTOR
AUGUST KAROLUS
BY *H. S. Brown*
ATTORNEY

UNITED STATES PATENT OFFICE

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PICTURE TRANSMISSION SYSTEM

August Karolus, Leipzig, Germany, assignor to
Radio Corporation of America, a corporation
of Delaware

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2 Claims. (Cl. 178—6)

The object of the invention is a construction element for optico-electric transmission means, especially for markedly enlarged reproduction or re-creation of a picture, optionally the visualizing thereof also at a distance (television). What is assumed to exist for each elementary area of the picture is a distinct electric transmission channel which begins in the photoelectric cell of the transmitter and ends in the coordinated luminous cell (glow lamp, gaseous conduction or television lamp or cathode luminescence tube) whose brightness is subject to control, at the receiving or re-creation station. All of the photoelectric cells, as known in the prior art, are crowded together upon a transmitter board or panel upon which the object of the transmission (original picture) is projected under conditions of maximum luminosity. In a similar way are composed all of the luminous cells to result in the picture re-creation surface or panel or board.

Now, the present invention discloses ways and means whereby the cost of each constituent transmission channel is reduced to a tolerable amount. Inasmuch as at the present state of sensitiveness of photocells it is not feasible to get along without amplification, the provision of at least one amplifier tube is indispensable in each channel. The size of such a tube, i. e., the emission expected of it, is governing to a substantial degree, so far as the cost of the installation is concerned. Hence, the aim is to get along with a cheap low power type of tube. On the other hand, especially where the re-creation or picture surface is of a large area and is mounted in large auditoriums where considerable stray illumination prevails besides, it is desirable to impart to each picture element considerable intrinsic or inherent brilliancy. When using luminous sources as stated, this leads to powers of 1 watt or over for each cell.

Now, these conflicting conditions and the attendant difficulties are overcome by this invention in the following way: Suppose the luminous cell at the end of each channel consists of a tiny glow lamp having a filament as slender as feasible and of minimum thermal capacity so that it will operate with as little inertia as feasible. Now, according to this invention the power for brightness variation of the filament is not furnished quantitatively by the amplifier tube. In fact, it is derived from an independent constant A. C. source (supply line) by way of the winding of a choke coil, say, a magnetic modulator, the second winding of which is traversed

by the plate current of the amplifier tube subject to the control of the photoelectric cell. The variable plate current of the tube, as will be seen, is not called upon in this case to furnish the modulation energy of the glow lamp (incandescent lamp), but is only expected to influence the inductance of the choke coil by way of variable biasing magnetization of the coil. By the aid of an anode current of definite size it is thus feasible to regulate or "dose" a far larger A. C. in the glow lamp circuit, with the consequence that the amplifier tube can be designed for relatively low emission and be manufactured at relatively lower cost.

My invention will best be understood by reference to the figures in which

Fig. 1 shows one embodiment thereof,

Fig. 2 shows another embodiment thereof, and

Fig. 3 shows a still further embodiment.

The drawing shows exemplified embodiments of the invention. Figure 1 shows a photoelectric cell, 2 is the grid resistance of the amplifier tube 3. These constituents are suitably assembled to result in a single construction unit, preferably arranged in series inside a tubular protective casing, connected with proper insulation and to insure low capacitance. 4 is the part of the magnetic modulator coil 5 which is traversed by the plate current of tube 3. 6 is another partial winding which is traversed by the working current of the glow lamp 7 derived from the A. C. source 8 and controlled by 4. The alternating current source consists, for instance, of the 50 cycles per second lighting circuit whose voltage is suitably transformed. In lieu of the glow lamp, as stated, also a gaseous conduction or television glow lamp could be employed, or else a luminous source be used which is predicated upon cathodic luminescence, and in some of these cases the conditions regarding the dimensions of the magnetic modulator coil will turn out more favorable.

To simplify the circuit scheme according to Fig. 1, the transformer device required for obtaining the low voltage A. C. fed in at 8 and connected with the available supply voltage could be combined with the choke coil 5, in that upon the iron core thereof is wrapped a third winding which is united with the line and in that moreover the low voltage winding 6 is directly closed by way of the incandescent lamp 7. In order that the relatively high alternating current voltage arising in the winding 4 may not unnecessarily burden the tube 3, recourse may be had to a compensating method of the kind disclosed by

Epstein and which has been used, for instance, in frequency multiplication by iron-cored changers. By the aid of this device known in the art, the alternating current component may be reduced
 5 down to zero so that only the flow of direct current in 4 will pass through the tube.

While so far the choke coil 5 in Fig. 1 was operated in the form of a magnetic modulator so-called, the same, as shown in Fig. 2, could be designed also to act as a stray choke 5 provided
 10 with a suitably regulable air gap. The denotations used in Fig. 2 correspond to those in Fig. 1. In the case of Fig. 2 the resistance induced by the choke coil in the circuit of the glow lamp 7 is a
 15 function of the load by the second winding 4. In order that this load may be purely alternating current it is possible to compensate the direct current flowing through tube 3 by the aid of the push-pull arrangement of two tubes as known in
 20 the prior art. Also in this instance the iron-core of 5 is suitably employed at the same time for the transformation (stepping down) of the supply line potential, and the low voltage winding 6 is directly closed through the glow lamp 7 as before
 25 described in reference to Fig. 1.

Referring to Fig. 3, there is shown the use of an arrangement with an adjustable or variable air gap. A photocell 1 is connected in series with
 30 a resistor 2 and is energized by the potential supply as shown. Connected in push-pull relationship with the resistor 2 are two vacuum tubes 3, one having its grid 10 connected to one side of the resistor 2, and the other having its grid
 35 11 joined to the other extremity of resistor 2. The cathodes 12 of the tubes are connected back through the center tap of the resistor 12 to the grids 10 and 11 by way of a biasing battery as indicated. The plates or anodes 13 and 14 which
 40 are joined in push-pull relationship to the winding 4 which is wound about one arm of the magnetic modulator having a core member 5. Also wound about an arm of the magnetic modulator is a second coil arrangement 6 to which is connected the lamp 7. Still a further third winding
 45 15 is wound about the core of the modulator and

to this latter winding is supplied an alternating current which may be the ordinary housing current. The adjustable air gap is indicated by means of the arrow on the drawing. The arrangement is such that the currents flowing
 5 through the winding 4 will change the reluctance of the magnetic path, and hence change the voltage induced in the windings 6 due to the flux set up by winding 15, the latter being energized by alternating current as hereinbefore indicated. 10

Having now described the invention, I claim and desire to secure by Letters Patent the following:

1. A modulation system comprising a filamentary light source, a source of variable intensity
 15 signals, amplifier means for said variable signals, a source of low frequency alternating current, a transformer of the iron core type, said iron core comprising an open yoke member with a variable air gap in the yoke, inductive means wound about
 20 an arm of said iron core and joined to the output of the aforementioned amplifier means, inductive means wound about an arm of the aforementioned iron core and joined to the source of alternating current, and inductive means wound about
 25 an arm of the transformer core and joined directly to the filament of said filamentary light source.

2. A modulation system comprising a filamentary light source, a source of variable intensity
 30 signals, push-pull amplifier means for said variable signals, a source of low frequency alternating current, a transformer of the iron core type, said iron core comprising an open yoke member with a variable air gap in the yoke, inductive
 35 means wound about an arm of said iron core and joined to the output of the aforementioned amplifier means, inductive means wound about an arm of the aforementioned iron core and joined to the source of alternating current, and inductive
 40 means wound about an arm of the transformer core and joined directly to the filament of said filamentary light source.

AUGUST KAROLUS.

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